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aecia that were studied. In agreement with others he finds that the cells of the central arch of the peridium are the apical cells of the central spore chains that have, before their metamorphosis into peridial cells, cut off intercalary cells below. All of the cells of the peridium are therefore morphologically aeciospores. An apparent exception to this was found in *Peridermium Pini*. In the division of the peridium initial cells of the central arch the usual process is reversed and the small intercalary cell is cut off above and the peridial cell below. A brief description of the fertilization processes in this species is given. Equal cell fusions similar to those first described by CHRISTMAN were found.—F. D. FROMME.

**Reciprocal crosses of *Oenothera*.**—DAVIS<sup>13</sup> has reported a partial confirmation of the results obtained by DE VRIES from reciprocal crosses between *Oenothera biennis* L. and *O. muricata* L. The observations of DAVIS also include reciprocal crosses between *O. biennis* L. and *O. franciscana* Bartlett, between *O. biennis* and *O. grandiflora* Solander, and between *O. muricata* L. and *O. gigas* De Vries. Detailed, parallel descriptions are given of the parents and of the pairs of reciprocals, together with numerous photographs of the plants in various stages of their growth. Except in the case of the *gigas-muricata* crosses, the reciprocals of which were in general without important distinguishing characters, the reciprocal crosses exhibited striking contrasting differences. In most respects the crosses closely resembled the pollen parent (patroclinous), as had been noted earlier by DE VRIES for one of these crosses, but strong matroclinous tendencies were also observed, particularly in certain features of the inflorescence of the *biennis-muricata* crosses. Red coloration was found to be wholly or partially dominant without respect to whether it was contributed by the paternal or maternal parent. Moreover, in all the crosses observed by DAVIS, even where patroclinous and matroclinous tendencies were most conspicuous, the influence of both parents was plainly recognizable. He has "observed no certain evidence that a morphological character of either species in a cross is passed on to the  $F_1$  hybrids exactly as it is represented in one or the other of the parents." This fact, DAVIS notes, would render untenable GOLDSCHMIDT's assumption of merogony, even though that explanation had not been made doubtful by the cytological data of RENNER. No satisfactory explanation of these results has been suggested.—R. A. EMERSON.

**Transpiration in succulent plants.**—DELF<sup>14</sup> has made an interesting study of the transpiration peculiarities of the different classes of succulent plants, having carried on a number of experiments and having endeavored to organize

<sup>13</sup> DAVIS, BRADLEY MOORE, Genetical studies on *Oenothera*, V. Zeitsch. Ind. Abst.- u. Vererbungslehre 12:169-205. 1914.

<sup>14</sup> DELF, E. MARION, Transpiration in succulent plants. Ann. Botany 26:409-442. 1912.

in a systematic way the very chaotic literature of the subject. It is concluded that the chief structural features of these plants are connected with the transpiring surface and the accumulation of water. As to the transpiring surface, there is a greater or less amount of reduction, supplemented in many cases by features that tend to diminish transpiration, such as protected stomata, aerial water absorption, wax coats, etc. The formation of the water tissue that is so characteristic of succulents seems to be "related to the production of organic acids, owing to the influence of limited gaseous exchange on metabolism, and to the presence of chlorides or sulphates in excess in the soil water." DELF agrees with HOLTERMANN that these considerations do not fully explain succulence, since some plants (as *Salicornia*) are so far modified as to be obligate halophytes, whereas other plants (as *Aster Tripolium*) are facultative halophytes, and still others (as *Suaeda fruticosa*) can endure either saline or non-saline habitats without appreciable structural change. In some cases succulence is a hereditary feature, whereas in others it is related to the conditions experienced by the individual showing it. The author believes that water tissue in all cases is of advantage in allowing a plant to "support a rate of water loss which is very considerable, relative to the transpiring surface."—H. C. COWLES.

**The vegetation of Clare Island, Ireland.**—A paper by R. L. PRAEGER on the vascular plants of Clare Island is but one of a large series of papers, published as Volume 31 of the Proceedings of the Royal Irish Academy.<sup>15</sup> The total number of papers or parts is 68, thus representing probably the most complete natural history survey ever made of any district in the world. The work has been carried on by more than a hundred specialists. The thoroughness with which the work has been done is well illustrated by the fact that in 18 papers there are recorded nearly 700 species of plants and animals not previously found in Ireland, 60 not previously found in the British Isles, and 17 species that are new to science.

Clare Island is an exposed headland, embracing six square miles, and situated three miles from the mainland. The highest point is 1500 feet above the sea. The number of vascular plants indigenous to the island is under 400. The dominating vegetation type is moorland, which includes practically everything over 200 feet. On the precipitous Croaghmore cliff, 1500 feet high, there is a remarkable alpine colony of 10 species, some of which come down almost to sea-level. There is a detailed and interesting discussion of the origin of the flora. Attention is given to the possibility of a land bridge. Wind and birds are regarded as more important than water as dispersing agents.

<sup>15</sup> PRAEGER, R. L., Phanerogamia and Pteridophyta. Clare Island Survey; a scientific survey of Clare Island, in the county of Mayo, Ireland, and of the adjoining parts of the mainland. Proc. Roy. Irish Acad. 31<sup>no</sup>: 1-112. pls. 6. 1911. The entire series can be secured for 60s. from the Secretary, Royal Irish Academy, Dawson St., Dublin.